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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/675.944

10/02/2003

Doron Shaked

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11/17/2006

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EXAMINER

SMITH, JEFFREY S

ART UNIT

PAPER NUMBER

2635

DATE MAILED: 11/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

### Application No.

10/675,944

### Applicant(s)

SHAKED, DORON

### Examiner

Jeffrey S. Smith

### Art Unit

2635

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/9/04 and 4/11/05</u> .                                      | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figures 1 and 2 must be labeled as prior art. Applicant is advised to employ the services of a competent patent draftsman outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 is directed to an apparatus. However, the body of the claim recites "a sub-sampling algorithm" and "one or more up-sampling algorithms," which are not structural elements, but rather are mathematical algorithms. Also, the "non-linear illumination estimation module" is not a structural element, but is instead defined by the functional term of producing an estimate, which is a mathematical process. Therefore, the claim as a whole is directed to a mathematical algorithm, which is non-statutory subject matter.

Claims 2-13, which depend from claim 1, are also directed to mathematical algorithms and are therefore non-statutory.

Claim 14 is directed to a method claim and includes the same mathematical steps of claim 1, including sub-sampling, estimating, and up-sampling, and is therefore non-statutory.

Claims 15-21, which depend from claim 14, are also directed to mathematical algorithms and are therefore non-statutory.

Claim 22 includes the mathematical steps of sub-sampling, estimating, applying a difference interpolation algorithm, applying an illumination interpolation algorithm, and averaging, and is therefore non-statutory.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,941,028 issued to Kimmel et al. ("Kimmel") in view of admitted prior art.

For claims 1 and 14, Kimmel discloses "a non-linear illumination estimation module that receives the sub-sampled images and produces corresponding interim illumination estimations." (See Column 3 lines 14-40).

Kimmel does not explicitly disclose "a sub-sampling algorithm...and one or more up-sampling algorithms."

Figure 2 of the admitted prior art discloses a sub-sampling algorithm. (See page 2 of the specification, in a "prior art Retinex-type algorithm, the illumination L is obtained from a sub-sampled version of the input image"). Figure 2 also shows one or more up-sampling algorithms. (See page 3, "an up-sample module 34" produces "an estimation of the illumination ... using interpolation").

It would have been obvious to one of ordinary skill in the art at the time of invention to use the sub-sampling and up-sampling algorithms of the admitted prior art with the non-linear retinex algorithm of Kimmel in order to speed up the computationally intensive retinex process, as taught in the admitted prior art on page 3 of the specification.

For claim 2, the admitted prior art discloses an illumination interpolation algorithm. (See page 3 of the specification).

For claims 3 and 15, Kimmel discloses an illumination interpolation algorithm that comprises local maximum routine. (See Kimmel at column 2 line 20 and column 12 line 25).

### ***Allowable Subject Matter***

Claims 4-13, 16-20 and 22 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 101, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The art of record does not disclose "a difference interpolation algorithm...receiving the difference of the sub-sampled images and the interim illumination estimations, and a sampling rate and producing the interpolated difference; and an adder that adds the interpolated difference and the input image" as recited in claim 4. Similarly, claims 5-13 and 16-22 each contain a combination of a difference interpolation algorithm and an illumination interpolation algorithm which is not disclosed in the art of record.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The articles by Ogata et al., Elad et al., Ramponi et al., and Alter-Gartenberg et al. give examples of non-linear Retinex algorithms.

U.S. Patent Nos. 6,947,176 issued to Kubo et al. and 6,788,822 issued to Zhang et al. give examples of non-linear multiscale Retinex devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey S. Smith whose telephone number is 571 270-1235. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marvin Lateef can be reached on 571 270-1245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JSS

JSS November 8, 2006

  
MARVIN LATEEF  
SUPERVISORY PATENT EXAMINER